

INCH-POUND

MIL-I-43553B

16 December 1992

SUPERSEDING

MIL-I-43553A

22 November 1985

MILITARY SPECIFICATION

INK, MARKING, EPOXY BASE

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers a catalyzed epoxy system of marking inks for metallic, or other non-porous, surfaces and printed wiring boards.

1.2 Classification. Marking ink covered by this specification shall be of the following types, as specified (see 6.6).

Type I	-	General usage
Type II	-	Nonconductive ink (for printed wiring boards)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, U.S. Army Missile Command, ATTN: AMSMI-RD-SE-TD-ST, Redstone Arsenal, AL 35898-5270 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A
DISTRIBUTION STATEMENT A.
distribution is unlimited.

FSC 7510
Approved for public release;

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

H-B-621	-	Brush, Stencil
TT-C-490	-	Cleaning Methods for Ferrous Surfaces and Pretreatments for Organic Coatings
PPP-B-591	-	Boxes, Fiberboard, Wood-Cleated
PPP-B-636	-	Box, Shipping, Fiberboard
PPP-C-96	-	Cans, Metal, 28 Gauge and Lighter

MILITARY

MIL-P-13949/4	-	Plastic Sheet, Laminated, Metal-Clad (for Printed Wiring Boards), Base Material GF, Glass Base, Woven, Majority Difunctional Epoxy Resin Flame Resistant, Copper-Clad
MIL-F-14256	-	Flux, Soldering, Liquid (Rosin Base) (For Electronic/Electrical Use)

STANDARDS

FEDERAL

FED-STD-141	-	Paint, Varnish, Lacquer and Related Materials: Methods of Inspection, Sampling and Testing
FED-STD-191	-	Textile Test Methods

MILITARY

MIL-STD-129	-	Marking for Shipment and Storage
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MIL-STD-202	-	Test Methods for Electronic and Electrical Component Parts
MIL-STD-810	-	Environmental Test Methods and Engineering Guidelines
MIL-STD-1190	-	Minimum Guidelines for Level C Preservation, Packing and Marking

(Unless otherwise indicated, copies of the federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Ave., Philadelphia, PA 19111-5094.)

2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 4.3).

3.2 Material. The contractor is given latitude in the selection of raw materials and processes of manufacture, provided the product conforms to this specification.

3.3 Color and quantity. The color and quantity of the cured ink shall be as specified in the purchase order or contract (see 6.2).

3.4 Composition. The ink shall be furnished in the form of two compounds; the basic ink compound and a hardener compound. The chemical composition of each compound shall be at the discretion of the manufacturer, and shall be such that the ink shall comply with all requirements specified herein.

3.4.1 Basic ink compound. The basic ink compound shall consist essentially of an epoxy resin in liquid, paste, or powder form.

3.4.2 Hardener compound. The hardener compound (catalyst) shall be in liquid, paste, or powder form for mixing with the ink compound just prior to using. The hardener shall cause the mixture to harden (cure) through chemical reaction at room ambient temperatures, or at other time/temperature ratios, as specified.

3.4.3 Additives. Ingredients may be added to the ink and hardener compounds to produce gloss or mat finishes. Other additives may be used to improve the leveling, flexibility, and adhesive qualities. No additives to type II ink shall affect its electrical resistance requirements (see 3.9).

3.4.4 Thinner. When specified in the contract or purchase order (see 6.2), a non-toxic thinner shall be furnished for reducing the ink for optimum application consistency. The thinner shall be compatible with the wiring board substrate.

3.5 Mixing properties. The ink and hardener compound shall mix freely to produce a homogeneous mixture, free from skins, lumps, sediment, and precipitant materials, and shall be of a consistency suitable for the intended method of application. After mixing, the chemical components shall not gel during the specified pot life of the ink at room ambient temperature, and chemicals that may separate shall be readily dispersible.

3.6 Pot life. The useful life of the combined 2-part ink when mixed as specified by the manufacturer shall be not less than 4 hours, unless otherwise specified by the manufacturer (see 4.6.2.1).

3.7 Curing. The ink, when applied mixed to a vertical or horizontal surface and air-cured for 5 days at room ambient temperature, or at other time and temperatures when recommended by the manufacturer, shall be completely cured for test purposes (see 4.6.2.2).

3.7.1 Cure for handling. The combined 2-part ink, when mixed as specified by the manufacturer, shall be cured for handling when exposed to a temperature of 65.5°C for 30 minutes (see 4.6.2.2.1).

3.8 Adhesion. Cured ink impressions on glass, steel, aluminum, copper and plastic shall not deteriorate when subjected to trichloroethylene vapors at 86.5 to 88°C for a period of not less than 3 minutes and not greater than 6 minutes (see 4.6.2.3).

3.9 Electrical resistance (for type II only). The material cured as specified herein and prior to high humidity conditioning, shall have an electrical resistance of not less than 10^{12} ohms. After conditioning as specified in 4.6.2.4, the material shall have an electrical resistivity of not less than 10^{10} ohms (see 4.6.2.4).

3.10 Environmental and storage conditions.

3.10.1 Abrasion resistance. Cured ink impressions shall retain their legibility after subjection to 300 to 303 revolutions of the CS-10 abrasive wheel while under a load of 2.2 pounds (see 4.6.3.1).

3.10.2 Chemical resistance. Cured ink impressions shall not deteriorate when immersed for 30 minutes in water, 1,1,1 trichloroethane, denatured ethyl alcohol, and methyl alcohol (see 4.6.3.2).

3.10.2.1 Chemical resistance (type II only). In addition to 3.11.2, type II cured ink shall be resistant to hot solder and solder flux (see 4.6.3.2.1).

3.10.3 Salt spray resistance. Cured ink impressions shall not deteriorate when exposed to a 20 percent (%) salt spray solution at 33 to 37°C for a period of not less than 48 hours (see 4.6.3.3).

3.10.4 Light fastness. Cured ink impressions shall not fade and shall remain legible when tested as specified in 4.6.3.4.

3.10.5 Stability. Cured ink impressions shall not fade, chip, peel, or flow and shall remain legible when exposed to a temperature of $118 \pm 3^{\circ}\text{C}$ for a period of not less than 24 hours (see 4.6.3.5).

3.10.6 Fungus resistance. Cured ink impressions shall not support fungi growth when tested in accordance with 4.6.3.6.

3.10.7 Storage life. The ink compounds shall be free from grit, lumps, and skins and shall not gel, settle, harden or otherwise deteriorate while stored for not less than one year in the original containers (see 4.6.5).

3.11 Workmanship. The materials shall be free of foreign particles and other contamination and shall be of uniform quality, condition, and appearance.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use

his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.4).
- b. Quality conformance inspection (see 4.5).

4.3 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in 4.6.

4.4 First article. The first article sample shall be prepared using the same materials and methods proposed for the preparation of subsequent production lots of ink. First article samples which do not meet all the requirements of this specification shall be rejected and returned to the supplier.

4.4.1 First article inspection. First article inspection shall be conducted only on the first article sample and shall consist of all examinations and tests specified herein.

4.5 Quality conformance inspection. Quality conformance inspection for acceptance of the ink shall be as specified in table I.

TABLE I. Quality conformance inspection

Requirement	Requirement paragraph	Test paragraph
Mixing properties	3.5	4.6.2.1
Pot life	3.6	4.6.2.1
Curing test	3.7	4.6.2.2
Curing for handling	3.7.1	4.6.2.2.1
Adhesion	3.8	4.6.2.3
Electrical resistance (type II)	3.9	4.6.2.4

4.5.1 Lot formation. An inspection lot shall consist of a group of like items produced at the same place using the same batches of materials, lots of components, process runs, fabrication techniques, assembly techniques, tools, equipment and facilities.

4.5.2 Unit of product. The unit of product shall consist of 1 container of ink and 1 container of hardener combined into a unit package (see 5.1.1).

4.5.3 Sampling.

4.5.3.1 Sampling for visual examination. Sampling for fill, color, workmanship, packaging, packing and marking shall be performed on one unit package.

4.5.3.2 Sampling for testing. Unless otherwise specified (see 6.2), the sample shall consist of one sample approximately equal in weight and volume to a unit package drawn from a single homogeneous mixture.

4.6 Test methods.

4.6.1 Test specimen preparation. The following test specimens shall be prepared from ink that has been mixed in accordance with the manufacturer's recommendations. The test plates shall be cleaned in accordance with applicable methods specified in TT-C-490 or any applicable process or combination of processes which will accomplish thorough cleaning without damage to the specimens before ink application.

4.6.1.1 Glass specimen. Prepare test specimens by applying the ink to two 4 x 4-inch pieces of glass. Using a stencil brush conforming to H-B-621, stencil the letters "ABCDE" approximately

.750 inches high. Use sufficient ink to obtain neat, legible letters, but not enough to cause the ink to smear. Cure in a flat (horizontal) position (see 3.7 and 3.8).

4.6.1.2 Copper, aluminum, steel, plastic specimens. Prepare test specimens by applying the ink to two 4 x 4-inch pieces of each of the following materials: sheet copper, aluminum, steel and plastic. Using a stencil brush conforming to H-B-621, stencil the letters "ABCDE" approximately .750 inches high. Use sufficient ink to obtain neat, legible letters, but not enough to cause the ink to smear. Cure on edge in a vertical position (see 3.7).

4.6.2 Testing for quality conformance.

4.6.2.1 Mixing properties and pot life tests. The useful (pot) life is ended when the mixed ink is too hard to work without the addition of thinner (see 3.6).

4.6.2.2 Curing test. To determine conformance to 3.7, one test specimen prepared in accordance with 4.6.1.1 and one each of those prepared in accordance with 4.6.1.2 shall be subjected to 5 days of air curing at room ambient temperature or at other time and temperatures when recommended by the manufacturer. After curing, the specimens shall be examined for complete cure without running, rippling, or loss of legibility or color.

4.6.2.2.1 Curing for handling test. Bake the newly prepared test specimens, one prepared in accordance with 4.6.1.1, and one of those prepared in accordance with 4.6.1.2, in an appropriate oven at 66.5°C for 30 minutes; remove and let cool for 10 minutes at room ambient temperature. Test with the finger, using moderate pressure. The ink shall be considered dry enough to handle when the soft tacky condition no longer exists and the ink feels dry to the touch.

4.6.2.3 Adhesion test. To determine conformance to 3.8, the cured test specimens, one in accordance with 4.6.1.1 and one each in accordance with 4.6.1.2, shall be subjected to trichloroethylene vapor cleaning at 86.5 to 88°C for not less than 3 minutes or more than 6 minutes in accordance with vapor degreasing methods approved by the procuring activity. The specimens shall be inspected for loosening, dissolving, disintegration or obliteration.

4.6.2.4 Electrical resistance (for type II only). Test samples shall be prepared using an epoxy-glass copper clad laminate conforming to MIL-P-13949/4, type GEN0610C2/00 A1A. Configuration

shall be as defined in figure 1. The electrical resistance tests shall be conducted with a potential of 500 volts direct current (Vdc). The samples shall be conditioned at standard conditions of $25 \pm 5^\circ\text{C}$ and relative humidity of $50 \pm 20\%$ and shall be checked for not less than a resistance of 10^{12} ohms. Immediately following this test, the samples shall be conditioned for 48 hours at standard temperature and 95% relative humidity. The samples shall be tested for not less than a resistivity of 10^{10} ohms at $25 \pm 5^\circ\text{C}$.

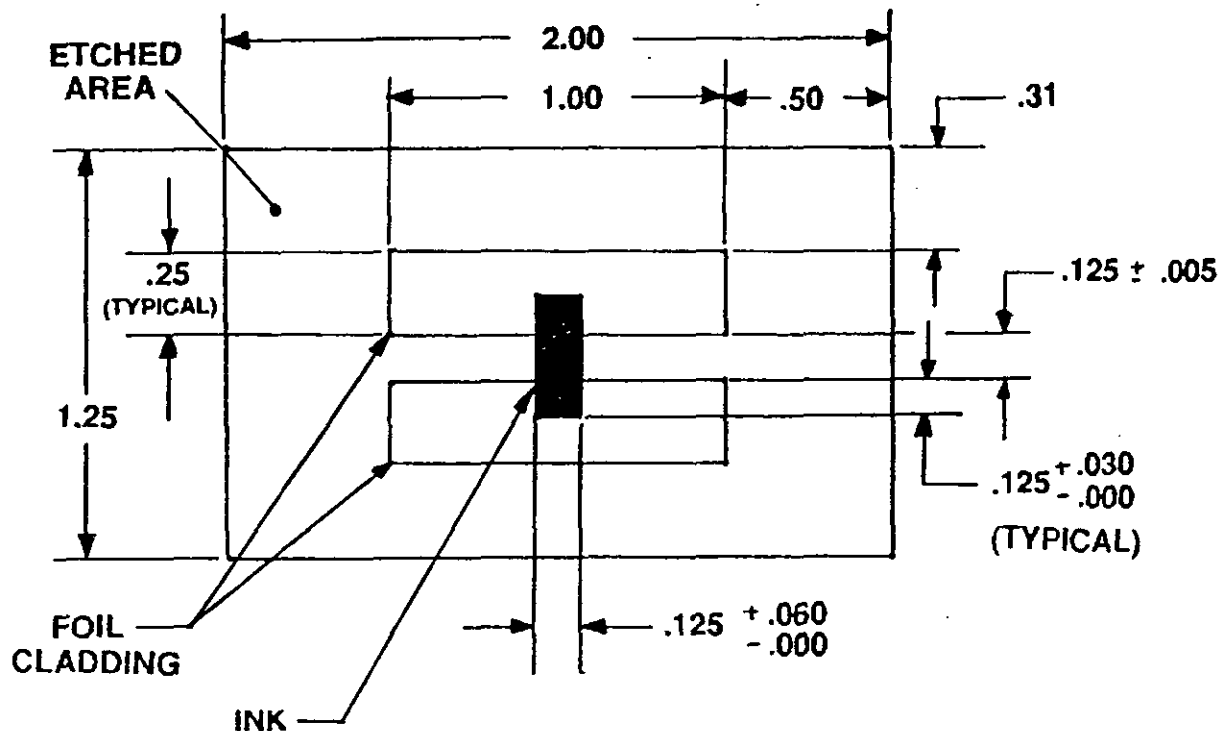


FIGURE 1. Resistivity test sample.

4.6.3 Testing for environmental and storage requirements.

4.6.3.1 Abrasion resistance. To determine conformance to 3.10.1 the test specimens, prepared in accordance with 4.6.1.1, and 4.6.1.2, shall be positioned with the ink impressions under the CS-10 abrasive wheel, and subjected to 300 revolutions under a load of 2.2 pounds, in accordance with method 6192 of FED-STD-141. The cured ink impressions shall be inspected for legibility.

4.6.3.2 Chemical resistance. To determine conformance to 3.10.2, two specimens of each material shall be prepared in accordance with 4.6.1.1 and 4.6.1.2. These specimens shall be immersed in water, 1.1.1 trichloroethane, denatured alcohol, and methyl alcohol, for a period of 30 minutes in each solution at a temperature of $30 \pm 1^\circ\text{C}$. After rinsing in water, the specimens shall be inspected for softness or damage.

4.6.3.2.1 Chemical resistance (type II only). To determine conformance to 3.10.2.1, two test samples, prepared as in figure 1, shall be coated with a thin continuous film of flux applied with acid brush over ink designator. The flux shall be rosin based type RMA in accordance with MIL-F-14256. The test shall be performed immediately after fluxing and the sample shall be floated, circuit side up, in a solder bath for ten seconds. Bath temperature shall be maintained at $260 \pm 5^\circ\text{C}$. Samples shall then be cooled to room temperature and immersed in solvent specified in 3.10.2 for one minute. The specimens shall then be examined for ink softness or damage.

4.6.3.3 Salt spray resistance. To determine conformance to 3.10.3, two test specimens, prepared in accordance with 4.6.1.1, shall be subjected for a period of 48 hours to a salt spray of 20 % salt solution at 33 to 37°C in accordance with test method 101, test condition B of MIL-STD-202. The specimens shall be inspected for evidence of deterioration or fading.

4.6.3.4 Light fastness test. To determine conformance to 3.10.4, one half of the surface of test specimens on glass, prepared in accordance with 4.6.1.1, and on copper, in accordance with 4.6.1.2, shall be covered to obscure light, and the remaining half shall be exposed for 24 hours to the radiation of a glass-enclosed, carbon-arc lamp in accordance with method 5660 of FED-STD-191. After exposure, the ink impressions shall be inspected for fading and loss of legibility.

4.6.3.5 Stability test. To determine conformance to 3.10.5, test specimens prepared in accordance with 4.6.1.1 on glass, and 4.6.1.2 on aluminum shall be heat aged at $118 \pm 3^\circ\text{C}$ in a suitable drying oven for a period of not less than 24 hours. The test specimens shall be inspected for thermal damage, loss of legibility, change of color, chipping, peeling, and flowing.

4.6.3.6 Fungus resistance. To determine conformance to 3.10.6, one glass test specimen of 4.6.1.1 of cured ink impressions, and one plastic test specimen of 4.6.1.2, shall be

plastic material in accordance with MIL-STD-810, Method 508.4. The test specimens shall be inspected and there shall be no evidence of fungi growth.

4.6.4 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents, unless otherwise excluded, amended, modified, or qualified in this document or applicable purchase order.

4.6.5 Certification. A certificate of compliance shall be furnished with each shipment of lot stating that the ink will have a shelf life of not less than one year free of the characteristics specified in 3.10.7.

4.7 Rejection. The entire lot of basic ink compound and hardener compound which does not meet the requirements of this specification shall be rejected and returned to the supplier.

4.8 Inspection of packaging. The sampling and inspection of the preservation, packaging, and container marking shall be in accordance with the requirements of section 5.

5. PACKAGING

5.1 Preservation. Preservation shall be level A or level C, as specified (see 6.2).

5.1.1 Level A. The basic ink compound and hardener compound shall be placed in separate 1-ounce, 1-pint, 1-quart, or 1-gallon metal cans or plastic containers as specified in the contract or purchase order. Metric equivalents are acceptable. The cans shall be oblong, conforming to type V, class 2, of PPP-C-96. The cans shall be fabricated from special coated manufacturer's terneplate and shall be provided with an exterior non-metallic coating in accordance with plan B of PPP-C-96. One can or plastic container of the ink compound and one can or container of the hardener compound shall be combined into a single container as a unit pack that will adequately protect the contents. When specified in the contract or purchase order, one of the cans or containers in the unit pack shall be of adequate size to serve as a mixing container. The ratio of the quantity of the ink to the quantity of the hardener shall be the same as the mixing ratio recommended by the supplier.

5.1.2 Level C. Unless otherwise specified, the ink compound and the hardener shall be packaged in accordance with MIL-STD-1190.

5.2 Packing. Packing shall be level A or level C, as specified (see 6.2).

5.2.1 Level A. Unit packages specified in 5.1.1 shall be overpacked in boxes conforming to PPP-B-591 class II, or PPP-B-636 type CF or SF. Boxes shall not exceed the applicable size and weight limitations of the box specification. Shipping containers shall be closed and strapped in accordance with the appendix of the applicable box specification.

5.2.2 Level C. The basic ink compound and hardener containers packaged in accordance with 5.1.2 shall be packed as specified in MIL-STD-1190.

5.3 Marking.

5.3.1 Level A. With the exception of bar code markings, each container of ink and hardener shall be labeled in accordance with MIL-STD-129 or MIL-STD-1190, as applicable. Bar code marking consistent with these standards may be provided at the option of the manufacturer. In addition, each container of ink and hardener shall contain the following:

- a. Name and address of the manufacturer
- b. Quantity and color
- c. Date of manufacture
- d. Deterioration and storage life instructions
- e. Contract or order number.

5.3.2 Unit package marking. In addition to the unit package marking required by MIL-STD-129 or MIL-STD-1190, each unit package container shall be marked as follows:

5.3.2.1 Basic ink compound container. Each basic ink compound container shall include the characteristics peculiar to the cured ink, recommended uses, instructions for mixing and application, and handling precautions.

5.3.2.2 Hardener compound container. Each hardener compound container shall include the statement "Catalyst for (insert product designation for basic ink compound)," instructions for mixing, and handling precautions.

5.3.2.3 Precautionary statement. The following precautionary statement shall be included in the labeling: WARNING: CAUSES IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION, AVOID CONTACT WITH EYES, SKIN, AND CLOTHING. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING.

5.3.3 Bar code marking. Bar code marking is not required when the area is less than 2.5 x 3.0-inches.

5.3.4 Level C. With the exception of bar code marking, interior and exterior containers shall be marked as specified in MIL-STD-1190 when that document is used as the packaging reference. Interior and exterior packs prepared in accordance with specific military requirements shall be marked as specified in MIL-STD-129.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Epoxy based marking ink covered by this specification is intended for marking rigid materials such as metal, glass, plastics, and other hard and durable materials. It is suitable for application by letter-press printing, roller and offset printing, rubber stamping, marking machine, silk screening, stencilling, spraying, and by hand with steel pen and brush. Type II ink is intended for use in marking printed wiring boards.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of the specification
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1)
- c. Whether first article sample is required (see 3.1)
- d. Color and quantity desired (see 3.3)

- e. Whether thinner is required and quantity (see 3.4.4)
- f. Sampling plans required, if other than specified (see 4.5.3.2)
- g. Selection of applicable level(s) of packaging and packing required (see 5.1 and 5.2)
- h. If mandatory to meet service conditions, specify whether basic compound and hardener shall be level A packaged in metal cans or plastic containers (see 5.1.1).

6.3 First article. When first article inspection is required, the contracting officer should provide specific guidance to offerers whether the item(s) should be a first article sample, a first production item, or a number of items to be tested as specified in 4.4. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.4 Handling precautions. The amine type hardener or catalyst used in this ink preparation is a health hazard. Precautions should be taken not only in mixing and curing, but also in the general handling of these catalysts. Proper ventilation and care in avoiding personal contact with these compounds should minimize the hazards of handling these materials.

6.5 Cross-reference data. Applications which reference MIL-I-43553, dated 12 January 1968, and which are in use prior to the approved date of revision A, dated 25 November 1985, apply to Type I ink (general usage), which is not to be used for marking printed wiring boards.

6.6 Part or identifying number (PIN). The PIN to be used for marking ink acquired to this specification are created as follows:

<u>M</u>	<u>43553 -</u>	<u>I</u>	<u>BLK</u>
Prefix to indicate military specification	Specification number	Type (see 1.2)	Color (see table II and 3.3)

TABLE II. Color identification.

Color	Dash identification character
black	BLK
red	RED
orange	ORN
yellow	YEL
green	GRN
blue	BLU
white	WHT

6.7 Metrication. Metric equivalents in accordance with FED-STD-376 are acceptable for use in this specification.

6.8 Subject term (keyword) listing.

Identification of materials
 Imprinting
 Offset printing
 Printing
 1.1.1 trichlorethane

6.9 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodian:

Army - MI
Navy - AS
Air Force - 99

Preparing Activity:

Army - MI

Review Activities:

Army - GL, MD, AR, EA
Navy - OS
Air Force - 84

Project No. 7510 - 0366

User Activities:

Army - AL, ME

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:		1. DOCUMENT NUMBER MIL-I-43553B	2. DOCUMENT DATE (YYMMDD) 921216
3. DOCUMENT TITLE INK, MARKING, EPOXY BASE			
4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)			
5. REASON FOR RECOMMENDATION			
6. SUBMITTER			
a. NAME (Last, First, Middle Initial)		b. ORGANIZATION	
c. ADDRESS (Include Zip Code)		d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (If applicable)	7. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY			
a. NAME COMMANDER U.S. ARMY MISSILE COMMAND		b. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON 746-6980	(2) AUTOVON 746-6980
c. ADDRESS (Include Zip Code) ATTN: AMSMI-RD-SE-TD-ST REDSTONE ARSENAL, AL 35898-5270		IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	